QUALITY ASSURANCE SAMPLING PLAN
FOR
SBA SHIPYARDS SITE INSPECTION
JENNINGS, JEFFERSON DAVIS PARISH, LOUISIANA

Prepared For

U.S. Environmental Protection Agency Region 6
1445 Ross Ave.
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Date Prepared
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1.0 INTRODUCTION

Dynamac Corporation (Dynamac), Superfund Technical Assessment and Response Team (START) is tasked by the U.S. Environmental Protection Agency (EPA), Region 6, under Technical Direction Document (TDD) No. TO-0009-12-10-02, to conduct a Site Inspection (SI) at SBA Shipyards (CERCLIS No. LAD008434185), located in Jennings, Jefferson Davis Parish, Louisiana (LA). See Figure 1 for the site location.

This Quality Assurance Sampling Plan (QASP) is prepared in partial fulfillment of the TDD. This QASP is designed to guide field operations during collection of surface water, sediment, groundwater, and soil samples, and describe Quality Assurance (QA) measures that will be implemented during the course of the SI field activities.

2.0 OBJECTIVES

The objectives of the SI, per the EPA Site Assessment Manager (SAM) are to:

1) coordinate an SI with the Louisiana Department of Environmental Quality (LDEQ) and the various property owners;

2) collect soil and groundwater samples for chemical analysis to document historical sources and contamination at the site; and

3) collect surface water and sediment samples for chemical analysis to document if a release to the Mermentau River or the contiguous wetlands has or is occurring.

To accomplish the above-mentioned objectives, START will collect one (1) waste sample from the buried barge; soil samples from twelve to sixteen (12 to 16) boring locations on-site (including a background location); collect groundwater from four (4) existing on-site monitor wells and six (6) nearby private water wells; and collect surface water and sediment samples from twelve (12) locations in the barge slip, dry dock,

wetlands, and the Mermentau River. An additional five (5) soil or sediment samples may be collected from locations selected by the EPA SAM.

3.0 BACKGROUND

3.1 Site Location

The SBA Shipyard facility (SBA) is situated on approximately 98 acres of land located in a rural-industrial area, at 9040 Castex Landing Road, Jennings, Jefferson Davis Parish, LA. The facility is within Section 19 of Range 2W, Township 10S and is located at the end of State Highway 3166 and adjacent to the west bank of the Mermentau River. The geographic coordinates at the abandoned office and facility entrance are Latitude 30.16415º North and Longitude 92.61588º West, obtained from a Trimble Geo Explorer 3 Global Positioning System (GPS) during the site reconnaissance inspection on December 11, 2012 (Figure 1; Figure 2).

3.2 Site Description

According to the LDEQ records, SBA has used the site for construction, repair, retrofitting, and cleaning of barges from 1965 through 1999. This facility is located in south Jennings, LA and bordered to the north by residents, south and west by wetlands, and to the east by the Mermentau River. Access to the property is restricted with fencing and locked gates.

Three barge slips and a dry dock are located off of the Mermentau River (Figure 3). They were used to dock barges while they were in for cleaning or repair. Reportedly a landfill was located north of the slip which was used for paint cans (Figure 3).

Wastes from the barge cleaning operations were managed in a waste management area that included four surface impoundments, a land treatment unit (LTU) and storage tanks. The wastes consisted of petroleum hydrocarbons. The

hydrocarbons were separated from the water into surface impoundments that were known as the Oil Pit, Water Pit 1, Water Pit 2, and Water Pit 3.

Interim removal activities were conducted from March 2001 through January 2005 under an EPA December 2002 Order and Agreement for Interim Measures/Removal Action (IM/RA). As part of the IM/RA, the Oil Pit and wastes from the storage tanks were stabilized and solidified for off-site disposal. Approximately 750,000 gallons of uncontaminated pond water was pumped from the former Water Pit to the drainage ditch that drains to the Mermentau River. The emptied Water Pit was then used to receive treated storm water from the partially buried barge. Pumpable oil materials were removed from the partially buried barge; which was then used to store contaminated storm water prior to treatment and discharge to the emptied Water Pit. Water from the barge was treated by sand filtration, followed by granulated activated carbon (GAC). The treated water was then pumped to the Water Pit, analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and Total Suspended Solids (TSS) and discharged. The Water Pit was closed by excavating a six -foot gap in the berm to the “Mermentau River bottomland” directly east of the pit. The partially buried barge, an asphalt tank, and partially scrapped metal from a former 10,000 barrel tank remained onsite after the IM/RA activities were conducted.

3.3 Site Operations

SBA was used for construction, building, repair, retrofitting and cleaning of barges. Barges serviced by SBA typically held diesel, coal tar, crude oil, gasoline and asphalt. Figure 3 shows the historical location of the former waste units.

The hydrocarbons were separated from the water into surface impoundments that were known as the Oil Pit, Water Pit 1, Water Pit 2 and Water Pit 3. Water was recycled to barge cleaning and some of the water was converted to steam for the cleaning operations. Aboveground oil/water separators and storage tanks eventually replaced the functions of the surface impoundments. Starting in 1989,

attempts were made to bio-remediate and close the impoundments. In 1991, the bioremediation was determined to be unsuccessful. Water and oil were pumped from Water Pit 1 to the storage tanks. The sludge in Water Pit 1 was solidified with fly-ash and lime. Approximately one-third of the material was placed in the LTU. The remaining material in Water Pit 1 was piled at the east end of Water Pit 1. Accumulated precipitation was periodically pumped from the west end of Water Pit 1 to storage tanks. The material in the LTU was periodically disked until 1993 to promote bioremediation.

3.4 Waste Characterization

Sources that remain at SBA include the following:

- Source No. 1 is a partially buried barge. The barge is approximately 250 feet (ft.) by 50 ft. The steel barge is located on the southeast portion of the property, north of a designated wetland area. Waste oil and fluids from the barge are being released into the aforementioned wetlands. An anonymous caller notified the National Response Center (NRC) in October 2012 that the barge was being scrapped and oil was being discharged to the surrounding soils. The material was also allowed to burn. LDEQ conducted an investigation and reported evidence of the scrapping efforts. The burning had been extinguished.

- Source No. 2 is a horizontal steel, aboveground storage tank (AST). The tank is located approximately 300 feet northwest of the barge. It allegedly contains approximately 50,000 pounds of solid asphaltic material. No secondary containment features are associated with the AST.

- Source No. 3 is a barge slip located off the Mermentau River. No sampling or other information is known or available.

- Source No. 5 is a dry dock located north of the barge slip. No sampling or other information is known or available.

- Source No. 6 is a former landfill. It is located north of the barge slip and was a swampy area that reportedly stored paint cans, brush and asphalt. No containment features were located at the landfill. No sampling or other information is available.

In addition to the sources above, stained soil areas were evident throughout the property. No evidence or documentation exists to determine if confirmation sampling was conducted after the surface impoundment areas were remediated.

4.0 FIELD OPERATIONS

4.1 Concept of Operations

4.1.1 Schedule

Field work will tentatively occur in April 2013 and is anticipated to require approximately six (6) days to complete, including mobilization and demobilization.

4.1.2 Health and Safety

Field activities will be conducted in accordance with EPA Standard Operating Procedures (SOPs), the Generic QAPP, and the site-specific Health and Safety Plan (HASP).

4.1.3 Site Access and Logistics

Access to the sample locations will be obtained by START and EPA.

4.2 Sampling Design

START will collect surface water and sediment to characterize the surface migration of contamination from the site to Mermentau River and the adjacent wetlands. Waste, water and soil samples will be collected to characterize on-site

contamination. Table 1 presents the anticipated number of samples, location descriptions, and proposed laboratory analyses. Figure 4 illustrates the proposed sample locations. Dedicated sampling equipment will be used wherever possible in an effort to eliminate any potential cross contamination concerns. All sampling activities will be documented in a logbook and photographically using EPA Environmental Response Team (ERT) SOP #2002 as guidance.

4.2.1 Subsurface Soil Sampling

Subsurface soil samples will be collected from 12 to 16 borings in the areas where the remediated surface impoundments and landfill were located and from a background location (Figure 4; Table 3). Four additional borings will be advanced based on visual observations and EPA SAM decision. Borings will be advanced using a direct push device to a maximum depth of 20 feet below ground surface (bgs), or until groundwater is encountered. Up to two samples will be collected from each boring, at depths to be determined in the field by visual observations and from organic vapor monitoring instruments. Samples collected in these areas will be grab samples. Soil samples will be collected using trowels and spoons and placed into the sample containers.

The samples collected will be sequentially labeled with the site identifier and a sequential sample number, e.g., SBA001 = SBA Shipyards sample 001.

The water and soil sampling will be conducted in accordance with SOPs; specifically, the EPA ERT SOP #2012 Soil Sampling (Appendix C) and SOP# 2007 Groundwater Sampling (Appendix D).

The samples will be shipped to the Houston EPA or designated Contract Laboratory Program (CLP) laboratory for Target Compound List (TCL) and Target Analyte List (TAL) constituents. Target analytes, compounds, and reporting limits are from the current CLP low concentration statement of work.

4.2.2 Groundwater Sampling

Groundwater samples will be collected from four existing, on-site monitoring wells (Figure 4). Groundwater samples will also be collected from six domestic wells located from the residences located north of the property.

Water quality parameters of pH, temperature, conductivity, dissolved oxygen and turbidity will be collected for each groundwater water sample and recorded into the site-specific logbook.

The water sampling will be conducted using low-flow techniques in accordance with SOPs; specifically, the EPA ERT SOP # 2007 Groundwater Sampling (Appendix D).

The samples will be shipped to the Houston EPA or designated CLP laboratory for TCL and TAL constituents. Target analytes, compounds, and reporting limits are from the current CLP low concentration statement of work.

4.2.3 Surface Water and Sediment Sampling

Sediment and surface water samples will be collected from three locations in the Mermentau River (background and two downstream locations) and from four locations in the wetlands located south of the property. A water and sediment sample will also be collected from a background wetland location away from facility impacts (Figure 4, Table 3). All samples will be grab samples. Water samples will be collected directly into the sample containers. Sediment samples will be collected using a sample retrieval tube with a rubber– lined gasket top to depths of 6-12 inches bgs. The sample will be transferred to sample containers. Target analytes, compounds, and reporting limits are from the current CLP low concentration statement of work.

The samples collected will be sequentially labeled with the site identifier and a sequential sample number, e.g., SBA001 = SBA Shipyards sample 001. The surface water and sediment sampling will be conducted in accordance with SOPs; specifically, the EPA ERT SOP #2013 Surface Water Sampling (Appendix A) and SOP #2016 Sediment Sampling (Appendix B). Water quality parameters of pH, temperature, conductivity, dissolved oxygen and turbidity will be collected for each off-site surface water sample and recorded into the site-specific logbook.

The surface water and sediment samples will be shipped to the Houston EPA or designated CLP laboratory for TCL and TAL analyses.

4.2.4 Waste Sampling

A waste sample will be collected from the buried barge. The waste sample will be collected directly into the sample container.

The sample will be shipped to the Houston EPA laboratory for TCL and TAL constituents.

4.3 Analytical Parameters

Water, soil and sediment samples will undergo chemical analysis by the Houston EPA laboratory or a CLP laboratory for TCL and TAL analyses using EPA or CLP SOW methods. The requested turn-around time for analytical results and corresponding Staged Electronic Data Deliverable (SEDD) will be fourteen (14) calendar days. The analytical methods are specified in Table 2.

4.4 Sample Preservation

Sample preservation will be conducted utilizing procedures in the *Contract Laboratory Program Guidance for Field Samplers, August 2004* or EPA ERT SOP # 2003 Sample Storage, Preservation Handling. All of the collected samples will be stored at less than 4º C.

4.5 Sample Packaging and Shipping

Samples will be packaged and shipped utilizing procedures in the *Contract Laboratory Program Guidance for Field Samplers, August 2004* or EPA ERT SOP # 2004 Sample Packaging Shipment. After the samples have been collected, the sampling data (station number, time collected, sampler, GPS coordinates, etc.,) and field measurements will be entered into the U.S. EPA's SCRIBE Enterprise software. SCRIBE will be used to generate sample labels and Chain-of-Custody (COC)/Traffic Reports (TR) forms for the collected samples to be shipped to the designated EPA, CLP, or procured laboratory for chemical analysis. SCRIBE software will serve as the sampling database for all the samples collected during the SI field activities.

All designated samples for chemical analysis will be packaged in appropriate sample containers. At a minimum, each sample container will contain a completed custody seal, bubble-wrapped, and placed in an individual plastic baggie. The packaged samples will then be placed into shipping coolers for shipment to the designated laboratory. Ice will be placed in the shipping cooler to preserve the collected samples to 4º C during transport to the laboratory. Completed custody seals will be placed on the outside of the shipping cooler in order to maintain the chain of custody of the collected samples.

4.6 Control of Contaminated Materials

Any investigation derived waste (IDW) generated through sampling operations will be contained in accordance with EPA ERT SOP #2049 IDW Management. It is anticipated that IDW will consist of personal protective equipment and used sampling equipment. Dedicated sampling equipment will be used in order to eliminate the generation of decontamination solutions and the collection of rinsate samples. All IDW will be disposed of at the direction of the EPA SAM. The IDW will be disposed at a permitted facility.

Should non-dedicated sampling equipment be utilized, it will be decontaminated prior to use and between each use using EPA ERT SOP #2006 Sampling Equipment Decontamination. Basic decontamination will consist of brushing gross particulate off sampling equipment with tap water and/or a scrub brush, followed by washing equipment with a soap solution of Liquinox® or Alconox® and tap water, and a final rinse using distilled or de-ionized water. After decontamination, the equipment will be allowed to gravity drain and air dry. The equipment will be wrapped in aluminum foil to minimize potential contamination if not immediately used.

5.0 QUALITY CONTROL

5.1 Laboratory Quality Control

Specific QC criteria have been developed to ensure that the Data Quality Objectives (DQOs) summarized in Table 4 in this QASP are met. The analytical methods for sample analysis has been selected on the basis of the required detection limits, known contaminants existing in the study area, and the range of analytes to be determined. Table 2 includes method numbers and reference guidance, sample containers, sample volume requirements, and sample preservatives.

5.2 Field Quality Control

The pH, conductivity, temperature, dissolved oxygen and turbidity meters will be calibrated using manufacture's procedures by START prior to use in the field each day.

5.3 Quality Assurance Samples

For Quality Assurance (QA) purposes, matrix spike/matrix spike duplicate (MS/MSD) samples will be collected on a frequency of 5%, per sample matrix. MS/MSD samples measure the performance of the method used, relative to the

sample matrix, and the precision of analysis in terms of relative percent difference (RPD). It is anticipated that one MS/MSD sample will be designated for the soil samples, one MS/MSD for the sediment samples, and one MS/MSD sample for the water samples.

Field duplicate samples, which are homogenized aliquots of a single sample used to assess the quality of sampling methods, sample handling, and laboratory procedures, will be collected on a frequency of 1 per 10 for the all matrices (10%). It is anticipated that at a minimum, six (6) duplicate samples (two [2] soil, one [1] sediment, and one [1] surface water) will be collected during the SI field activities.

5.4 Chain of Custody

After sample collection and identification, all samples to be shipped to the EPA Houston Regional Laboratory or a CLP Laboratory, and will be handled in strict accordance with chain-of-custody protocol, per EPA ERT SOP #2002, Sample Documentation. All sampling data will be entered into the U.S. EPA's SCRIBE Enterprise software, which will provide a database of all sample collection data and prepare the necessary chain-of-custody (COC) forms and sample labels. A chain-of-custody record will be maintained from the time the sample is taken to its final deposition. Every transfer of samples and custody will be noted and signed for, and a copy of this record kept by each individual/organization who has signed. When samples (or groups of samples) are not under direct control of the individual responsible for them, they must be stored in a locked container sealed with a custody seal.

The COC record should include (at minimum) the following:

- Sample identification number
- Sample information
- Sample location
- Sample date
- Name(s) and signature(s) of sampler(s)
- Signature(s) of any individual(s) with control over samples

6.0 RECONCILIATION WITH DATA QUALITY OBJECTIVES

The sample data will be assessed for accuracy, precision, completeness, representativeness, and comparability. Data assessment criteria are presented in the Dynamac START Generic QAPP, Section 4.0 “Assessment and Oversight” and Section 5.0, “Data Validation and Usability.” Generally, data that do not meet the established acceptance criteria are cause for re-sampling and re-analysis. However, in some cases, data that do not meet acceptance criteria are usable with specified limitations. Data that are indicated as usable with limitations will be included in the final report, but will be clearly indicated as having limited usability. Indicators of data limitations include data qualifiers, quantitative evaluations, and narrative statements regarding potential bias. The EPA ESAT contractor will conduct the data validation activities on the received CLP laboratory analytical data packages. START will review the validation report from ESAT and enter the data into SCRIBE Enterprise.

7.0 DELIVERABLES AND PROJECT ORGANIZATION

Upon completion of the inspection, a report will be prepared documenting all pertinent field and sampling activities, detailed site sketch/map, potential environmental receptors, and the results of sample laboratory analyses.

The EPA SAM, Brenda Cook, will provide overall direction for this project and will identify sampling needs, determine the sampling schedule, and coordinate community relations.

The START Task Leader (TL), Kristine Lloyd is the primary contact with the EPA. The START TL is responsible for project team organization, supervision of all project tasks, monitoring, and documenting the quality of all work produced by the project team, determining deviations from the QASP, and assisting with the overall sampling effort.

TABLE 1
Sample Collection Summary

Sample Matrix	Sample Location	Analyses	Composites or Grab Samples	Trip Blank Samples	MS/MSD	Field Duplicates	Rinsates
On-site Surface water	3 locations (Figure 4)	TCL TAL	Grab	None	1 per 20 samples	1 per 10 samples	NA
On-site and off-site Sediment	10 locations (Figure 4)	TCL TAL	Grab	None	1 per 20 samples	1 per 10 samples	NA
Soil	12-16 designated locations and 4 locations to be determined in field, up to 2 samples per location (Figure 4)	TCL TAL	Grab	None	1 per 20 samples	1 per 10 samples	NA
Groundwater	10 locations (Figure 4)	TCL TAL	Grab	None	Included with surface water	Included with surface water	NA
Sediment or Soil	5 optional locations (locations to be determined in field)	TCL TAL	Grab	None	1 per 20 samples (included with soils or sediments)	1 per 10 samples (included with soils or sediments)	NA
Waste	1 location	TCL TAL	Grab	None	None	None	None

KEY
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not applicable
TAL – Target Analyte List
TCL – Target Compound List

TABLE 2
SAMPLING and ANALYSIS SUMMARY

Matrix	Analytical Parameter	Analytical Method	Containers (Number, Size, and Type)	Preservation Requirements	No. of Samples	No. Field Duplicates	No. MS/MSD Pairs	No. of Equipment Rinsate Samples	No. of Trip Blanks	Total Number of Samples to Lab*
Surface Water	VOCs SVOCs Pest Arochlors Metals, Hg, CN (TCL, TAL)	EPA Regional Laboratory or current CLP SOW (EPA 8260/8270/ 6010/7471)	2, 1-liter amber glass bottle; 3 40-ml VOA vials; 2 1- liter poly bottles	Cool to 4ºC Metals – HNO3 to pH < 2; Cyanide – NaOH to pH>12	3	1	1	0	0	4
Sediments	TCL, TAL	EPA Regional Laboratory or current CLP SOW	2, 8 oz. glass jars; 2, 4-oz. glass jars	Cool to 4ºC	10	1	1	0	0	11
Soil	TCL, TAL	EPA Regional Laboratory or current CLP SOW	2, 8 oz. glass jars; 2, 4-oz. glass jars	Cool to 4ºC	24 (6)	2	2	0	0	26 (7)
Groundwater	TCL, TAL	EPA Regional Laboratory or current CLP SOW	2, 1-liter amber glass bottle; 3 40-ml VOA vials; 2 1- liter poly bottles	Cool to 4ºC	10	0	0	0	0	10
Waste	TCL, TAL	EPA Regional Laboratory	2, 1-liter amber bottles	Cool to 4oC	1	0	0	0	0	1

Notes:

*Total number of samples to the laboratory does not include MS/MSD samples. However, please note that MS/MSD or spike/duplicate analysis may require additional sample volume.

(X) Number of optional samples that may be collected; samples may be sediments or soils.

KEY

ºC - Degrees Celsius
CLP – Contract Laboratory Program
HNO_3 – Nitric Acid
MS/MSD – Matrix Spike/Matrix Spike Duplicate
N/A – Not applicable
NaOH – Sodium Hydroxide
SOW – Statement of Work
TCL – Target Compound List
TAL – Target Analyte List

TABLE 3
Proposed Sample Locations
SBA Shipyards

Location ID	Sample Location	Sample Type
SBA-001	Background boring, north near SBA office building	Soil
SBA-002	Boring, former impoundment area	Soil
SBA-003	Boring, former impoundment area	Soil
SBA-004	Boring, former impoundment area	Soil
SBA-005	Boring, former impoundment area	Soil
SBA-006	Boring, near the former landfill area	Soil
SBA-007	Boring, near the former landfill area	Soil
SBA-008	Boring, near the former landfill area	Soil
SBA-009	Boring, location to be determined	Soil
SBA-010	Boring, location to be determined	Soil
SBA-011	Boring, location to be determined	Soil
SBA-012	Boring, location to be determined	Soil
SBA-013	Material from buried barge	Liquid
SBA-014	Monitor Well 1	Water
SBA-015	Monitor Well 2	Water
SBA-016	Monitor Well 3	Water
SBA-017	Monitor Well 4	Water
SBA-018	Private Well	Water
SBA-019	Private Well	Water
SBA-020	Private Well	Water
SBA-021	Private Well	Water
SBA-022	Private Well	Water
SBA-023	Private Well	Water
SBA-024	Barge Slip – west side	Sediment
SBA-025	Barge Slip – east side	Sediment
SBA-026	Dry Dock – northwest side	Sediment
SBA-027	Dry Dock – northeast side	Sediment
SBA-028	Mermentau River Background	Sediment/water
SBA-029	Mermentau River – downstream	Sediment/water
SBA-030	Mermentau River - downstream	Sediment/water
SBA-031	Wetlands near the PPE from the buried barge	Sediment
SBA-032	Wetlands southeast of PPE	Sediment
SBA-033	Wetlands south of the PPE	Sediment
SBA-034	Wetlands southwest of the PPE	Sediment

Table 4 DATA QUALITY OBJECTIVES SBA Shipyards SI	
STEP 1. STATE THE PROBLEM	
Determine if CERCLA hazardous substances are present in the surface waters, ground waters, sediments and soils at the site and if they are migrating from the site to surface waters and ground waters.	
STEP 2. IDENTIFY THE DECISION	
If CERCLA hazardous substances are present in the surface water, ground water, sediments and soil at the site, the site is eligible for HRS consideration. If CERCLA hazardous substances are present in thesurface water, potential or actual releases to the HRS surface water pathway can be documented.	
IDENTIFY THE ALTERNATIVE ACTIONS THAT MAY BE TAKEN BASED ON THE DECISIONS.	If CERCLA hazardous substances are found in the surface water, ground water, sediments or soils at the site, HRS evaluation of the site can be conducted. If CERCLA hazardous substances are found in the water or sediment of the Mermentau River and the wetlands south of the property, an observed release is documented, if not a potential release will be used for HRS evaluation.
STEP 3. IDENTIFY INPUTS TO THE DECISION	
IDENTIFY THE INFORMATIONAL INPUTS NEEDED TO RESOLVE A DECISION.	Surface water, ground water, sediment and soil samples from the site, surface water and sediment samples from drainage from the site. HRS Rule
IDENTIFY THE SOURCES FOR EACH INFORMATIONAL INPUT AND LIST THE INPUTS THAT ARE OBTAINED THROUGH ENVIRONMENTAL MEASUREMENTS.	HRS Rule is published. All sample results are environmental measurements
BASIS FOR THE CONTAMINANT SPECIFIC ACTION LEVELS.	HRS rule, background concentrations, sample CRQLs
IDENTIFY POTENTIAL SAMPLING TECHNIQUES AND APPROPRIATE ANALYTICAL METHODS.	On-Site waters and soils – Surface water and sediment samples will be collected using dippers, soil samples will be collected using split spoon samplers, and ground water samples will be collected using low flow pumps. Samples will be analyzed for TCL and TAL using EPA methods utilized by the Houston EPA Lab or current CLP SOWs.
STEP 4. DEFINE THE BOUNDARIES OF THE STUDY	
DEFINE THE DOMAIN OR GEOGRAPHICAL AREA WITHIN WHICH ALL DECISIONS MUST APPLY.	The 98 acres that comprise the facility. The drainage pathways into the wetlands and its flow on the southeast side of the site.
SPECIFY THE CHARACTERISTICS THAT DEFINE THE POPULATION OF INTEREST.	The primary population of interest are the users of groundwater within the 4 mile TDL and the surface water and ecological receptors within the 15 mile TDL for the surface water pathway. The secondary population of interest is residents living within the 4 mile target distance limit for the air exposure pathway.
DEFINE THE SCALE OF THE DECISION MAKING.	Bounds of the samples collected.
DETERMINE THE TIMEFRAME TO WHICH THE DATA APPLY.	Results from this and subsequent potential investigations.
DETERMINE WHEN TO COLLECT THE	Sample collection will be conducted in April

Table 4 DATA QUALITY OBJECTIVES SBA Shipyards SI	
DATA.	2013.
IDENTIFY PRACTICAL CONSTRAINTS ON DATA COLLECTION.	START/EPA must obtain access agreements from property owners before sampling.
STEP 5. DEVELOP A DECISION RULE	
SPECIFY THE PARAMETER THAT CHARACTERIZES THE POPULATION OF INTEREST.	VOCs, SVOCs, Pest, Arochlors, and total metals/mercury and cyanide within the waters and soils at the site.
SPECIFY THE ACTION LEVEL FOR THE DECISION.	Contaminants present in the samples of soil, sediment or water at the site. Concentration greater than SQL if not detected in the background samples, greater than 3 times the background concentration if detected in background samples.
DEVELOP A DECISION RULE.	If CERCLA hazardous substances are present at concentrations greater than their SQLs in the water, sediment and/or soil samples collected at the site, sources will be evaluated using the HRS model. If the concentration of a hazardous substance at the site is greater than its SQL in the off-site surface water or sediments samples and the substance is not detected in background samples, a release to that pathway will be evaluated, or if a hazardous substance at the site is detected in the background sample and its concentration in the off-site surface water or sediment samples is greater than its SQL and 3 times greater that the concentration in the background sample, a release to that pathway will be evaluated, else no release can be documented.
STEP 6. SPECIFY THE LIMITS ON DECISION ERRORS	
DETERMINE THE POSSIBLE RANGE OF THE PARAMETER OF INTEREST.	Concentrations may range from less than SQL/reporting limit to greater than 10,000 ppm.
DEFINE BOTH TYPES OF DECISION ERRORS AND IDENTIFY THE POTENTIAL CONSEQUENCES OF EACH.	1. Deciding that the concentrations are below HRS criteria when they are actually greater. 2. Deciding that the concentrations are above HRS criteria when they are actually lower.
ESTABLISH THE TRUE STATE OF NATURE FOR EACH DECISION RULE.	1. Concentrations are greater than HRS criteria 2. Concentration are less than HRS criteria
DEFINE THE TRUE STATE OF NATURE FOR THE MORE SEVERE DECISION ERROR AS THE BASELINE CONDITION OR THE NULL HYPOTHESIS (H_o), AND DEFINE THE TRUE STATE FOR THE LESS SEVERE DECISION ERROR AS THE ALTERNATIVE HYPOTHESIS (H_a).	The more sever decision error is to decide that the concentrations are below HRS criteria when they are actually above criteria, Ho – Null hypothesis. Alternate hypothesis – H1 – concentrations are above HRS criteria when they are actually below criteria.
ASSIGN THE TERMS “FALSE POSITIVE” AND “FALSE NEGATIVE” TO THE PROPER DECISION ERRORS.	Ho = false negative H1 = false positive
ASSIGN THE PROBABILITY VALUES TO POINTS ABOVE AND BELOW THE ACTION LEVEL THAT REFLECT THE ACCEPTABLE PROBABILITY FOR THE OCCURENCES OF DECISION ERRORS.	Probability values not assigned at this time.
STEP 7. OPTIMIZE THE DESIGN	

Table 4 DATA QUALITY OBJECTIVES SBA Shipyards SI	
REVIEW THE DQOs.	
DEVELOP GENERAL SAMPLING AND ANALYSIS DESIGN. The QASP that these DQOs are attached to reflect the sample and analysis design to meet these objectives.	

APPENDIX A

EPA ERT SOP No. 2013 – Surface Water Sampling

APPENDIX B

EPA ERT SOP No. 2016 – Sediment Sampling

APPENDIX C

EPA ERT SOP No. 2012 – Soil Sampling

APPENDIX D

EPA ERT SOP No. 2007 – Groundwater Well Sampling

FIGURES